

berry bushes, and on the top ridge itself I captured one *Nconympha geminata*. It rained so often that butterflies were not at all common.

We had a rival collector in a humming bird that we saw on one occasion fly often out from a tree, remain poised in the air for a time, and then return to its perch. Upon a nearer approach it was discovered that the bird was collecting small insects that were flying before the wind. It was not at all afraid of us, but kept up its entomological pursuits while we stood close by.

Where a number of *Yucca filamentosa* plants had taken possession of a field in the valley, much to the disgust of the owner, we found many of the interesting little moths known as *Pronuba yuccasella*. When we jarred the tall heads of flowers the little moths would fall in numbers into the umbrella along with much water deposited by a passing shower. We became so muddy and bedraggled among these yucca plants that we took to a large brook, shoes, trousers and all, for the purpose of getting somewhat cleaner. That night it was so cold that the warmth of a roaring log fire built in an ample chimney place was most welcome.

On warm evenings we placed our lamps on the piazza and thus collected a considerable number of species. The active bug, *Sirthenea carinata*, was one of those so captured, and we also found it a restful way of collecting after our efforts afield, and our almost daily wetting by the rain.

NEW SPECIES OF NOCTUIDÆ FOR 1910. NO. 1.

BY JOHN B. SMITH, Sc.D.,

NEW BRUNSWICK, N. J.

Noctua corrodera, new species.

Head, thorax and primaries a deep rusty red-brown. Disc of thorax tending to become paler, more yellowish. Primaries with costal area more or less yellowish, veins tending to become blackish outwardly, with accompanying yellowish shadings. Median lines marked by small costal spots only. Ordinary spots indicated by vague yellowish blotches. Median and submedian vein narrowly black marked throughout, the others tending to become so beyond the location of the t. p. line. S.t. line a more or less obvious series of pale interspaceal dots near to and almost parallel with outer margin. A diffuse pale terminal line. Secondaries in the ♂ white, the veins outwardly

marked with dusky: in the ♀ a little yellowish in tinge. Beneath, primaries a little smoky, the margins reddish powdered and with an incomplete extramedian line: secondaries paler or whitish, reddish powdered along costal area, with an incomplete extramedian line.

Expands, 1.28-1.45 inches = 32-36 mm.

Habitat.—Pullman, Washington (Piper); Reno, Nevada; Fort Collins, Colorado, April 12 and July 8 (Doll).

Two males and two females in good or fair condition. The species belongs to the *piscipellis* series; but is brighter in color than any of the described species, with the transverse maculation almost completely wanting. The concolorous front and collar differentiate it from most of the allied forms.

***Aplectoides livalis*, new species.**

Mottled olivaceous gray over a white ground, markings black, clear cut. Head white, front with an incomplete black line, vertex becoming olivaceous. Collar olivaceous to a dusty shading below the white tip. Disc of thorax and patagia mottled, black and white. Abdomen dull gray. Primaries with a rather even olivaceous shading over the white ground, the lines black, included spaces white. Maculation very similar to *speciosa*, but much better defined, more contrasting, without any brown shadings; really more like *pressa* in general appearance and size. A distinct black bar below median vein between the basal and t. a. lines. A black bar, which is probably variable in definition, between the lower portion of the ordinary spots. Orbicular irregular, tending to become incomplete above. Reniform with a black center, smaller and more irregular than in *speciosa*.

Expands, 1.60 inches = 40 mm.

Habitat.—Newfoundland.

This seems to be a good species, although in essentials the maculation is like that of *speciosa*. The latter however is always darker, more obscure and tends to a uniformity of coloring rather than a heightening of the contrasts. The type is a single male in very good condition without date or specific location. I believe it was included among the material received from Mr. Wm. T. Bryant, of Cohasset, Mass.*

* Since the above was prepared Sir George F. Hampson writes: "I have got a very distinct new *Aplectoides* from Newfoundland allied to *speciosa* . . . ; it is much smaller than *speciosa*, black and white with hardly any brown tinge and a very small orbicular which is erect, open above and constricted at middle."

I have little doubt this refers to my species, although my example seems larger and the orbicular is certainly not constricted at middle.

Rhizagrotis actona, new species.

Whitish, more or less powdered with black, so as to give a very light ash gray tint. In the male there is a slight admixture of luteous and the powdering is less dense. Head and thorax concolorous. Primaries with basal and t. a. lines marked on costa only. T. p. line strongly outcurved over cell, then very even, almost parallel with outer margin. It is single, not well defined, best marked on the veins, sometimes tending to punctiform. S. t. line marked by an outward dusky shading, with strong outward dents reaching the margin on veins 3 and 4, and an almost equally strong outward angle touching margin just below apex. Fringes whitish, cut with black opposite the interspaces. Veins narrowly black marked. Claviform a narrow loop extending from base to middle of wing, more or less well defined by black edging, which sometimes appears as a solid line toward base and tends to become lost outwardly. Ordinary spots small, whitish or with a trace of luteous, more or less defined and shaded by black scales. Orbicular narrow, oblique, tending to extend toward and even unite with the small, narrow, somewhat crescent-shaped reniform. Secondaries white, veins outwardly dusky, a venular punctiform extramedian line. Beneath, white in the male; in the female the primaries smoky, both wings with a punctiform outer line.

Expands, 1.30-1.50 inches = 33-37 mm.

Habitat.—Stockton, Utah, IV, VI, VII, IX, Mr. Spalding.

Two males and seven females in good or fair condition. The insect is allied to *albalis* but is less even in color, seems narrower winged, the females are decidedly smaller and darker and the t. p. line is much better defined than in any *albalis* that I have seen. The species are close allies, but look obviously distinct when equal series are associated in the collection.

Peridroma serano, new species.

Head deep smoky brown, palpi black at sides. Collar gray, mottled with brown, with a narrow brown line crossing middle. Thoracic crests marked with gray, else reddish brown. Primaries brown: basal area to t. a. line except within basal line washed with gray; median area a richer, more purplish brown; terminal space darker, smoky brown. Basal line geminate, distinct, brown. T. a. line geminate, brown, very evenly oblique. T. p. line not distinct, defined rather by the contrasts between median and s. t. spaces, evenly sinuate. S. t. line also defined by the darker contrasting terminal area, and a little irregular in course. A series of small black terminal lunules and a narrow pale line at base of fringes. Claviform small, pointed, black. Orbicular large, open to the costa, somewhat V-shaped. Space between it and reniform deep black. Reniform large, open, not defined except by the preceding black spot. Secondaries pale smoky. Beneath, primaries dull smoky brown; secondaries whitish, powdery along the costal area, with a partial extra-median line and a small discal spot.

Expands, 1.60 inches = 40 mm.

Habitat.—Chiricahua Mts., Ariz.

Two females in good condition. The species has the habitus and somewhat the color of a well marked *saucia* with the markings tending to the *c-nigrum* type. It is a very well-marked form and may be described from Mexico, though I cannot identify it with anything in Hampson's work, and saw nothing like it in the Schaus collection.

***Feltia musa*, new species.**

General color a bluish gray over chocolate brown. Head paler red-brown. Collar brown at base, a black median line, then a light gray band below the black tip. Thoracic disc and patagia light gray. Primaries very smoothly clothed, the markings neatly written. Basal line marked only by geminate costal dots very close to base. T. a. line well removed outwardly, single, black, almost upright, outwardly a little bent on costal vein, inwardly more prominently angled on the submedian. The claviform begins at base in the form of two almost contiguous black lines and extends just a little beyond the t. a. line. T. p. line single, crenulate, brown, with a slight outcurve followed by a more feeble incurve. Beyond this line the tint is evenly gray, and there is no trace of a s. t. line. A series of small blackish terminal lunules, followed by a yellow line at base of fringes. In the median space the cell is black or blackish around the small spots, and a dusky shade extends to the costa. Below the cell a faint median shade is traceable through the outer portion. Orbicular small, round or a little extended, sharply defined, concolorous with ground. Reniform narrow, crescent shaped, sharply defined except inferiorly, concolorous with ground. Secondaries evenly smoky in both sexes. Beneath smoky, all wings with a well-marked outer band and discal lunule.

Expands, 1.32-1.48 inches = 33-37 mm.

Habitat.—New Foundland.

One male and one female, both somewhat defective; but fresh and perfect when first papered, so that the colors and maculation are clearly defined. The species is allied to *volubilis*, but differs in the very even coloring, the light gray thorax and the lack of all maculation beyond the t. p. line. There are other details that differ as can be seen by comparing the description. Unfortunately neither specimen has antennæ. I am not sure as to just where these specimens were collected but think it was at Grand Ledge, by Mr. Owen Bryant.

***Porosagrotis catenuloides*, new species.**

This name is proposed for the species that I have everywhere determined as *catenula* Grt., in collections. This species, allied to

the *victusta* (*muramula*) of the East, is common throughout the Rocky Mountain region and westward, and I found it named *catenula* Grt., in all collections accessible to me over twenty-five years ago—some of the determinations by Mr. Grote himself. I never questioned the species and, in 1900, described as *Carncades contagionis* a species which then came into my hands for the first time. Recently I sent specimens of my species to Sir George F. Hampson and he informs me that *contagionis* is identical with the type of *catenula*. A reference to the original description of that species puts the matter beyond doubt, and *contagionis* must sink as a duplication of *catenula*. But that leaves the species now universally labelled *catenula* in American collections without a name, and for that I propose the term *catenuloides*.

Euxoa andera, new species.

Head gray tending to brown, with a black band across middle of front and another between antennæ. Collar light gray below a broad black median band, darker ash gray above it. Thorax brownish, disc tending to gray. Primaries bluish gray, costal region much paler, through the center a brownish shade which is usually broken in the s. t. space. Transverse maculation lost. A black streak from base below median vein may or may not end in a small, loop-like claviform. The ordinary spots are fused, orbicular elongate, open above to the costa, altogether or in part; reniform small, upright, usu-

ally complete, but sometimes open to costa; inferiorly both spots are sharply defined by the black shade which fills the cell to the median vein. Terminal space dusky, irregular, more or less emphasized by interspaceal blackish streaks. A narrow pale line at base of fringes. Secondaries white in the male, pale smoky in the female.

Expands, 1.12–1.40 inches = 28–35 mm.

Habitat.—Stockton, Utah, September, October (Tom Spalding); Glenwood Springs, Colorado (Barnes); Pullman, Washington (Piper); Readington and Santa Catalina Mts., Pima Co., Arizona, September (Barnes).

A dozen specimens, male and female, are now before me and I have had many more. This is the species that I have had for years as *hollemanni* Grt., and have distributed under that name in all directions. The receipt recently, of a much darker form, with smoky secondaries in the male, almost black in the female, has caused a reëxamination of material and descriptions, resulting in the discovery that this pale form with almost identical markings is really

distinct, and that the true *hollemani* Grt. is a very dark and very rare form.

***Oncocnemis gerdis*, new species.**

Head and lower half of collar chocolate-brown, a narrow black line bordering the dark part of collar. Thorax and primaries bluish gray with black powderings, upper half of collar a little creamy in tinge. Primaries with the markings neat, slender, black. T. a. line single, continuous, a little irregular, but as a whole nearly upright. T. p. line single, continuous, outwardly oblique to vein 6, there forming almost a rectangle, with an inward bend to vein 4, then slightly incurved or nearly upright to the inner margin. There is no s. t. line. Claviform an ovate loop of good size, black ringed, concolorous. Orbicular small, round or nearly so, with a black central dot. Reniform nearly upright, black ringed, of good size, the upper and lower angles touching the t. p. line so that the angle of that line forms a roughly trigonate inclosed area. There is a black streak at base which does not quite reach the t. a. line. A black streak extends from the outer border of orbicular through the reniform, crosses the t. p. line just above the angulation, and extends to the outer margin; but abruptly narrowed just before, the final connection being formed by a narrower streak. Small interspaceal streaks through the terminal area to the outer margin. A black interrupted terminal line. Secondaries white, with a partial series of blackish terminal lunules toward the apex. Beneath white; primaries with the disc powdery and the long discal streaks obscurely reproduced; secondaries blackish powdered along the costal margin only.

Expands, 1.08 inches = 27 mm.

Habitat.—Arizona: Yavapai Co., May 3, Hutson; Baboquavaria Mts., Pima Co.

Two male examples in fair condition. This is a slight species, clearly yet inconspicuously marked, and allied to my *semicollaris* in general habitus.

***Oncocnemis intruda*, new species.**

Head, thorax and primaries bluish gray, with a strigate appearance as a whole. Head tending to creamy white in front, and the collar to the same at extreme base. Collar with a narrow black line below middle, above it a diffuse whitish band and the tip also is whitish. Patagia and thoracic disc strigate with blackish and tending to dusky submargins. Primaries strigate, the ordinary transverse maculation barely traceable. T. a. line marked by a black dot on costa, and below that only vaguely indicated. T. p. line black marked on costa, and again traceable below vein 3, where a few paler scales may emphasize the narrow dusky markings. S. t. line broken, consists of a vague oblique shade inward from apex to vein 6; outwardly a little paler, inwardly a little darker than ground; on veins 3 and 4 obscure outward dents are traceable, and below that point the line becomes conspicuous,

whitish, with a sharp inward tooth opposite the hind angle. There is no obvious claviform. Orbicular consists of a sagittate blackish mark. Reniform a small blackish lunule in a yellowish undefined blotch. A narrow black streak at base; all the veins marked with black or blackish; a series of interspaceal black streaks in the terminal area. Secondaries soiled whitish, all the veins conspicuously smoky; a dusky outer border which, in the female, tends to become rather definite; an obscure discal lunule. Beneath whitish, powdery, with an extra-median dusky line and a small discal spot on all wings.

Expands, 1-1.12 inches = 25-28 mm.

Habitat.—Deming, New Mexico, Sept. 1-7.

One male, one female from Dr. Barnes, the female in good, the male in only fair condition. The female is also the best marked of the two and has served as the base for the description. The species is a chunky one and belongs with *ciliata* in general habitus.

***Oncocnemis sanina*, new species.**

Resembles *levis* in general appearance, but smaller, less definitely marked throughout, the secondaries not so decidedly yellowish in tinge. The collar has a distinct, narrow black cross line; but lacks the double line below the tip. The claviform is less definite, smaller, less acute and does not in any case extend across the median space or touch the t. p. line. The ordinary spots are less well defined and tend to become pale, blotchy in appearance. The interspaceal dark marks before and after the s. t. line are not clear cut but diffuse, and the rayed appearance through the terminal area is not nearly so well marked.

Expands, 1.12-1.20 inches = 28-30 mm.

Habitat.—Gunnison, Colo., July 9.

One male, four females, in fair condition only. Has been associated with *levis* in my collection; but always with a query. The material at hand is now sufficient to convince me that we have a distinct form to deal with.

***Oncocnemis nita*, new species.**

Ground color dull ashen gray over luteous, mottled and powdery. Head and thorax without definite markings. Primaries with all the transverse maculation present, but broken and undefined. Basal line single, black, broken, obscure. T. a. line geminate, blackish, broken, a little irregular and tending to outwardly oblique. T. p. line more obvious, acutely projected over the reniform, very oblique and a little incurved below. The inner edge is marked by black scales, beyond which a rusty yellowish shading merges diffusely into the s. t. space. S. t. line yellowish or whitish, irregular, diffuse, extending to outer margin of veins 3 and 4, preceded by irregular black marks in the interspaces. A series of black terminal lunules. Fringes whitish. Clavi-

form loop-like, incompletely defined by yellowish scales. Orbicular moderate, almost round, whitish ringed, with yellowish filling. Reniform moderate, kidney-shaped, paler than ground, annulate with whitish. Secondaries whitish at base, with a vague outer smoky border and a series of dark terminal lunules. Beneath whitish, primaries outwardly smoky, all wings with an outer line, most distinct on secondaries, a series of terminal lunules and secondaries with a small discal spot.

Expands, 1.20 inches = 30 mm.

Habitat.—San Diego, California, X, 26, XI, 7.

One male, one female, in fair condition, from Mr. George H. Field, received under the number 71, and associated with *O. augustus* which it resembles closely at first sight. It is smaller however, gray instead of brownish, much less distinctly marked, and the course of the t. p. line is quite different, resembling that of *levis* more nearly and lacking the characteristic inward bend of *augustus* on the internal vein.

***Mamestra tenisca*, new species.**

Ground color a smooth reddish fawn. Head and thorax vaguely mottled with darker, brownish shades, collar with a brown transverse line which is never well-marked and tends to become altogether lost. Primaries with median and terminal spaces darker, more distinctly fawn colored; s. t. space with a yellowish tinge beyond the t. p. line tending to a rich, velvety reddish tinge toward the s. t. line. Basal line geminate, oblique, traceable to the submedian vein, slightly angulated on the veins, the defining lines obscure, included space a little pale powdered. The entire line is obscure and not equally marked in any two examples. T. a. line oblique, a little outcurved in the interspaces the inward teeth noticeable on the subcostal and submedian vein. It is geminate, but the inner line is incomplete and the outer scarcely defined against the dark median space, leaving the narrow, whitish included line as the best defining mark. T. p. line similar in make-up, abruptly exerted over the cell, then inwardly oblique, with a very slight incurve, so that the median space on the inner margin is distinctly narrowed; narrower than the basal space and usually no wider than the space beyond it. S. t. line irregular, narrow, pale, rather well defined against the terminal space. An obscure broken terminal line; a distinct yellowish line at base of the long fringes which are cut with yellowish beyond the veins. Claviform small, loop-like, defined by a slightly darker line and sometimes by paler included scales. Orbicular oblique, irregular, usually open to the costa, narrowly outlined in white, concolorous or only a little paler. Reniform small, rather narrow, upright, only a little narrowed at middle, conspicuously white ringed, concolorous or only a little paler in center. Secondaries smoky in both sexes, with pale fringes. Beneath, all wings with a distinct discal mark: primaries

smoky to blackish, secondaries paler, with blackish powderings and a tendency to an extra-median line.

Expands, 1.12-1.20 inches = 28-30 mm.

Habitat.—Stockton, Utah, IX, 5-15 (Spalding); Bozeman, Montana, VIII, 31, IX, 6 (Exper. Sta.).

Four males and two females, all in good condition. The species at first sight resembles *stricta* Wlk., and is probably confused with it in collections. It is, however, decidedly larger, *stricta* averaging less than inch, and is a much more evenly marked and smoother species. In this respect it is nearer to *spiculosa*, which it also resembles more nearly in color and, finally, the narrow whitish outline of orbicular and filling to the ordinary lines is characteristic, if not equally marked in all the specimens.

Mamestra nipana, new species.

Ground color reddish fawn-gray, with darker, smoky brown shadings. Head and thorax a little mottled, but without definite markings or shadings. No obvious dorsal tuftings on abdomen. Primaries without conspicuous markings; the outer part of the median space is, on the whole a little darker, the s. t. space, on the whole a little paler than the rest of the wing. All the lines and markings traceable but none are well defined. Basal line geminate, incomplete, a few black scales usually connecting it with base in the submedian space, and black scales may extend beyond it at this point. T. a. line geminate, outwardly oblique and outcurved between veins, very obscurely defined. T. p. line very even, only a little outcurved over cell, almost evenly oblique below. Median shade a little darker, narrower, parallel and close to t. p. line, crossing and a little darkening the reniform. S. t. line pale, narrow, broken, a little irregular. A series of small black terminal dots followed by a yellowish line at the base of the long concolorous fringes. Claviform small, barely indicated by dark scales in some specimens, altogether lost in others. Orbicular obscure, moderate in size, concolorous, incompletely outlined by darker scales or a paler annulus within its margin. Reniform moderate in size, with a somewhat darker brown border inwardly, and outwardly with two whitish dots at the forking of the submedian vein. Secondaries smoky, with a brown tinge, darkening outwardly to a brown line basing the paler fringes. Beneath reddish gray, powdery, veins with whitish scales; primaries with an obscure discal lunule and an outer line; secondaries more whitish except along costa, with a dusky lunule and incomplete extra-median line.

Expands, .96-1.10 inches = 24-27 mm.

Habitat.—Arizona: Baboquivaria Mts., Pima Co., VII, 15-13, and southern Arizona (Poling), Minnehaha, Yavapai Co., VIII, 11 (Hutson).

Six females, all in good condition. In general pattern and wing-

form resembles *montara*, and there is just a bare possibility that it may be the female of that species. But the ground color is totally different, the relative contrasts are not the same, and the Arizona form gives the impression of a *Tæniocampid*, while the Californian form would be more readily referred to *Perigea*. Besides I do not know of any similar sexual contrasts in this series.

It should be said for both these species that the hairy clothing of the eyes is very short, stiff and, apparently easily broken. A casual examination might, therefore, easily cause an erroneous generic reference.

***Mamestra montara*, new species.**

General ground color creamy gray, powdered with black and smoky brown. Head and thorax without definite markings, the margins of patagia and tips of tuftings somewhat more obviously darkened by the black scales. No distinct dorsal tuftings on abdomen. Primaries with all the normal maculation marked, but incomplete and broken, the most obvious feature being a dusky median shade which is rather evenly outcurved, is nearly parallel to the t. p. line and crosses the reniform. Basal line distinct, rather well defined by blackish shadings, a narrow black streak connecting it with base in the submedian interspace, and an irregular blotch marking the outer edge at the same point. T. a. line geminate, well removed from base, outwardly oblique, a little outcurved in the interspaces, the edges incomplete and not well defined. T. p. line geminate, very even, only a little outcurved over the cell and almost evenly oblique below it: the defining lines not well-marked. Three rather well-marked whitish dots on costa in the s. t. space. S. t. line marked chiefly by the contrasting dark terminal space and by small irregular dusky preceding shades. A series of black terminal lunules, which are preceded by larger lunules of the pale ground, and thus stand out in some relief against the dark terminal area. Claviform small, marked by black scales, not complete in any example. Orbicular round or nearly so, moderate to large size, concolorous, completely defined or only by a small difference in tint. Reniform rather large, ovate, oblique, not constricted, darkened by the median shade, inwardly defined by black scales and a very narrow white line, outwardly with a somewhat well-defined series of white dots, which are narrowly limited by black scales. Secondaries whitish, semi-transparent, becoming dusky toward the outer margin, which is bordered by a blackish line at the base of the white fringes. A small discal lunule, visible from underside. A slight excision on outer margin below apex, not equally marked in all specimens. Beneath whitish, with variable, coarse dark powderings; primaries a little smoky, with a discal lunule and a variably defined exterior line; secondaries with a distinct discal lunule, the powdering most obvious along the costal area.

Expands, 1-1.08 inches = 25-27 mm.

Habitat.—Claremont, California, Mr. Chas. W. Metz.

Seven males, in good to fair condition and, on the whole, very much alike. There is some difference in the amount of powdering and in the relative distinctness of the median shade; but that may be due to some extent to the condition of the specimens; some being evidently more flown than others.

Mamestra gatei, new species.

Dull powdery gray over a luteous ground, without strong contrasts of any kind. Collar with an obscure dark line across the middle. Disc of thorax powdery. Abdomen only a little paler gray, dorsal tuft distinct on basal segment only, second tuft small. Primaries powdery, with all the transverse maculation obscure, broken, the lines marked by geminate black or blackish spots on costa; but only irregularly traceable beyond that point. S. t. line marked by the slightly darker terminal space, deeply bisinuate, sometimes preceded by darker shadings or even sagittate blackish spots in the fifth and sixth interspace. A series of very small black terminal lunules; a yellowish line at base of fringes, which are very narrowly cut with yellowish over the veins. A small black basal streak, scarcely extending beyond the basal line. Claviform large, extending half way across median space, traceably outlined by black scales and sometimes by an obvious black line. Orbicular small, round, black-ringed, with a small central dot. Reniform large, kidney-shaped, a little constricted in center, outlined in black, inferiorly filled with darker, leaden gray; but not contrastingly so. Secondaries white; in the male with a narrow blackish powdered margin, in the female with a broader dusky border; fringes white. Beneath, white, powdery outwardly and along costal region; an extra-median series of venular black dots, and a black discal spot on all wings.

Expands, 1.15-1.30 inches = 29-33 mm.

Habitat.—Fort Wingate, New Mexico, IX, 4-10.

Eight males and five females in good condition. A purchased lot, collector unknown. The antennæ of the males are ciliate merely, the joints very slightly marked. It is an obscure species allied to *Yakima* in wing-form and general appearance; but much darker and unlike any other species known to me. It is somewhat after the *trifolii* type and associated with that series. There is not, however, any definite W-mark in the s. t. line.

Mamestra meodana, new species.

Ground color pale bluish gray, washed with faded reddish fawn. Head varying a little in tint between gray and fawn. Collar inferiorly whitish, a dark line separating the brownish tip. Thoracic disc a little mottled, patagia with a dusky submargin. Dorsal tuftings of abdomen obscure. Primaries with all the maculation distinct, but not contrasting or conspicuously mottled. The median lines are white filled, the defining edges narrow, even and only a

little darker than the ground. Course of lines as in *legitima*. Orbicular with a distinct whitish annulus and a tendency to a gray suffusion; in shape ovate, oblique, tending to become irregularly enlarged costally. Reniform large, imperfectly kidney-shaped, with a very narrow, incomplete white line, and a tendency to a reddish tinge. S. t. line whitish, complete, narrow, forming a W on veins 3 and 4 which extends to the outer margin. Vein 1 is whitish powdered beyond the t. a. line, and vein 2 for its entire length. Other veins tending to become somewhat powdered. Claviform short, pointed, with narrow black margin that tends to become inwardly diffuse, partially darkening the lumen. There is a broken black terminal line, a narrow yellow line at base of fringes, and the latter are narrowly cut with yellow. Secondaries smoky yellowish, with a dusky outer border and paler fringes. Beneath yellowish gray, pale, powdery, with a large discal spot on each wing.

Expands, 1.30-1.50 inches = 32-38 mm.

Habitat.—Calgary, Alberta, VI, 16-VII, 8; Arrowhead Lake, B. C., VII, 8; Pullman, Washington, V, 29, VI, 2; Yellowstone Park, Wyoming, VII, 8-15 Denver, Colorado.

A series of 11 males and 5 females, mostly in good condition. The species has been confused with *liquida* Grt., which is a much more contrastingly mottled form occurring in Washington and probably over a similar range. *Liquida* as described, and as figured by Hampson, has narrower, more pointed primaries and, while the type of maculation is similar, *meodana* is neatly and quietly ornamented, while *liquida* is strongly contrasted and showy.

Scotogramma francisca, new species.

Ground color grayish luteous, scantily powdered with black and ornamented with white. Palpi with blackish hairs at tip, front with a black transverse bar below antennæ, this bar edged with white scales. Collar smooth, with a central black line and a blackish shade below a white tip. Patagia well defined, with a black submarginal line. A central divided crest tipped with white scales. Primaries with all the lines well marked, more or less conspicuously white between narrow broken blackish edgings. Basal line well marked, extending to middle of wing. T. a. line well removed from base, rather evenly oblique, a little irregular in course. T. p. line abruptly bent below costa over cell, then a little denticulate on the veins, evenly oblique to the inner margin rather close to t. a. line. S. t. line whitish, a little irregular, well defined inwardly by the dark s. t. space, outwardly more or less diffuse, a whitish powdering extending into the terminal space and cutting the broad fringes on the veins. A smoky median shade is well marked between the ordinary spots and traceable across the wing. Claviform small, edged with black and centered with white scales. Orbicular small, round or nearly so, with a narrow blackish and an inner whitish ring, center concolorous with ground. Reniform small, oblong, oblique, a little constricted at middle, ringed

with whitish and usually a little paler than ground. Secondaries smoky yellowish at base, with a broad, rather well-defined blackish outer border. Fringes whitish, with a smoky interline. Beneath coarsely powdered; primaries with margins largely smoky, secondaries with a smoky outer border, a vague extra-median line and a small discal spot.

Expands, 1.00-1.06 inches = 25-26 mm.

Habitat.—San Francisco, California, Sept. 21, Oct. 4, Mr. F. X. Williams.

Two males and two females in good condition. The males have the antennal joints a little marked and bristle-tufted and the abdomen at base with loose dorsal tufting.

The species is allied to *stretchii* Hy. Edw., which is referred to *Polia* by Hampson; but for a variety of reasons I prefer to hold our species as at present arranged in my list. The body is plump and the wings are comparatively short and trigonate.

Luperina extensa Sm., Journ. N. Y. Ent. Soc., XIII, 203, 1905, Regina.

Perigea flavistriga Sm., Journ. N. Y. Ent. Soc., XIII, 204, 1905, Lethbridge, Alberta.

The type of the former is a large somewhat defective male with diffuse markings, and the resemblance to *passer* distinctly emphasized. The type of the latter is a very small example in good condition with very narrow, well defined maculation, which gave it a totally different appearance. A small series from Bozeman, Montana, sent in by Prof. Cooley connects the two and proves them identical. The species must stand as *Luperina extensa*.

***Copicucullia incresa*, new species.**

Head, dark grayish brown or blackish. Collar with the upper margin smoky; a distinct black transverse line inferiorly and two cloudy shade-lines more centrally. Disc of thorax deep, blackish-brown, margins of patagia dusky. Abdomen with dorsal tuftings small, dark brown. Primaries ashen gray, with a clean bluish tint in the male, a sordid smoky tint in the female. The transverse maculation is obsolete, the t. a. line barely traceable in some examples; veins narrowly lined with black or shaded with smoky; a dusky shading along the internal margin and a curved dusky streak above the anal angle. A series of terminal interspaceal lunules which tend to unite into a line toward the hind angle. Ordinary spots small, distinct but not conspicuous; orbicular round, annulate with yellowish, with a smoky center; reniform incompletely outlined, broadly kidney-shaped, yellowish and brown powdered. Secondaries in the male pure white with obscure terminal smoky lunules; in the female smoky brown with white fringes, scarcely paler at the base. Beneath, in the male very pale gray, almost white; in the female smoky

brown, more or less powdery, the secondaries more whitish at base and more obviously powdered than the primaries.

Expands, 37-40 mm. = 1.48-1.60 inches.

Habitat.—Claremont, California.

Two males, two females, in good condition from Mr. C. W. Metz, without dates of capture. The species is a very well-marked one in the division with the well-marked ordinary spots and obsolete median lines. The difference between the sexes is very marked and, at first blush, the two do not look at all alike. The male is the smaller with the primaries proportionately narrower and more pointed, while the color is a clean bluish-gray with white secondaries. The female has a sordid smoky and somewhat luteous tinge, and the secondaries are decidedly smoky throughout.

SOME AUSTRALIAN BEES IN THE BERLIN MUSEUM.

BY PROF. T. D. A. COCKERELL,

BOULDER, COLORADO.

About 180 species of Australian bees were described by F. Smith, of the British Museum; I have published about 130 others, and in addition some 35 have been described by various authors. I have in manuscript a complete list, but it evidently represents only a small part of the existing fauna. Every new collection is full of novelties, especially if coming from a little searched locality. The present paper puts on record some species in the Berlin Museum, for the loan of which I am indebted to the kindness of Mr. Embrik Strand.

Palæorhiza perkinsi, new species.

Female.—Length about 9 mm.; head and thorax dark blue, strongly and densely punctured; abdomen with the first segment except the extreme base, the second segment, and the third except the broad apical margin, a very fine deep chestnut red, with a slight purple tint; rest of abdomen very dark blue, becoming black at apex, and with coarse black hair; legs, except trochanters, mainly red, but anterior femora dark bluish, with only the apical part in front red, and tibiae all more or less black on outer side, the hind ones least so; clypeus greenish; face with three longitudinal dull white stripes, one from